CHANGE ISSUE – RTCA/DO-242

MASPS for ADS-B Rev. A

Tracking Information (committee secretary only)	
Change Issue Number	64
Submission Date	2/22/02
Status (open/closed/deferred)	Rev A – CLOSED
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Short Title for Change Issue:	Define a new on-condition Status Change (SC) report that can be used to support rapid update of time-critical elements in other reports.

MASPS Document Reference:		Originator Information:	
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Paragraph number(s)		E-mail	Stuart.Searight@tc.faa.gov
Table/Figure number(s)		Other	

Proposed Rationale for Consideration (originator should check all that apply):	
X	Item needed to support of near-term MASPS/MOPS development
X	DO-260/ED-102 1090 MHz Link MOPS Rev A
	ASA MASPS
	TIS-B MASPS
X	UAT MOPS
	Item needed to support applications that have well defined concept of operation
	Has complete application description
	Has initial validation via operational test/evaluation
	Has supporting analysis, if candidate stressing application
	Item needed for harmonization with international requirements
	Item identified during recent ADS-B development activities and operational evaluations
	MASPS clarifications and correction item
	Validation/modification of questioned MASPS requirement item
	Military use provision item
	New requirement item (must be associated with traffic surveillance to support ASAS)

Nature of Issue:		Editorial		Clarity	X	Performance		Functional

Issue Description:

The reorganization of the State Vector (SV) and Mode Status (MS) reports (IP33) and the creation of the Target Change (TC) report for long-term intent information (IP26) has created the need to define an additional report to rapidly convey changes in the values of some MS and TC elements. This is needed because of the criticality of these fields and the lower update rates of the reports.

Fields identified as "time-critical" in this regard from the MS report are as follows:

- TCAS Installed and Operational CC code;
- TCAS/ACAS RA active OM code;
- NACP;
- NACV; and
- SIL.

(*continued on next page*)

Issue Description (*continued*):

Fields identified as "time-critical" in this regard from the TC report are as follows:

- TC Cycle Number;
- TC Management Indicator.

Also, the MS elements "Emergency/Priority Status" and "IDENT Switch Active" should be updated rapidly when their values change. However, since these are primarily for air-ground use, it is hypothesized that they will not need to be included in the SC report.

DO-242A must make it very explicit that changes to these fields must be conveyed rapidly, but that that does not mean the entire MS or TC report needs to be updated at a higher rate.

Originator's proposed resolution:

The creation of the Status Change report will be a convenient way of signifying those elements of other reports that – when their values change – need to be updated rapidly. However, it should be stressed that this report will be only on the receiving subsystem to assist the report assembly function in updating these report elements. If a particular ADS-B implementation can support the update of these report elements directly with transmitted messages, this report would not need to be used.

Since there has not been proper validation of the update rates or duration of broadcast for messages reporting changes in the SC elements, those requirements should not be specified in DO-242A. Instead, recommendations should be included that the update rate be equal to that of the SV report, and duration of message broadcasts be equal to the SV coast interval for MS elements, and equal to twice the TC report nominal update interval for TC elements.

Working Group 6 Deliberations:

February 22, 2002: This Issue Paper was created to document the agreed to creation of the SC report at the February 2002 WG6 meeting. While the paper itself was not directly reviewed by WG6 at the meeting, the MASPS text that closes this Issue Paper has been reviewed and agreed to by WG6. Therefore, this Issue Paper will be addressed in Revision A.

Working Group 6 Final Resolution:

A new section defining the Status Change On Condition report was created per the above Issue Paper. This MASPS text can be found in §3.4.6 "Status Change Report" and its subsections of the draft DO-242A sent to RTCA on March 4, 2002. Also, references to the SC report have been included in the sections discussion the Mode-Status report (§3.4.4) and the Trajectory Change Report (§3.4.9).

Section 3.4.6 is shown in Attachment A of this Issue Paper.

3.4.6 Status Change (SC) Report

Note: While this version of the MASPS defines the format of this report and conditions which trigger its broadcast, update requirements of this report are to be defined in a future revision of this MASPS.

The Status Change (SC) report provides rapid update of time-critical information in the Mode Status and Trajectory Change reports. This report was created so that time-critical information can be updated in rapid fashion with a minimum data set being transmitted. This report is intended for use by the report assembly function of the receiving ADS-B subsystem. Reception of this report indicates a critical element of MS or the current TC+0 report has changed. This report is not intended to assist in ADS-B applications. Messages supporting MS or TC report updates can be used in lieu of sending this report.

Table 3.4.6 lists the report elements. Messages to support this report will be broadcast when one or more of its elements change from their last communicated value in either the MS and TC reports. Those elements are indicated in the MS and TC definition tables (§3.4.4, and §3.4.9, respectively).

Table 3.4.6: Status Change (SC) Report Definition.

	SC Elem. #	Contents [Resolution or # of bits]	Reference Section	Notes
ID	1	Participant Address [24 bits]	2.1.2.2.2.1	
	2	Address Qualifier [4 bits]	2.1.2.2.2.2	
TOA	3	Time of Applicability [1 s resolution]	3.4.6.3	
TCAS Status	4a	TCAS Installed and operational [1 bit]	3.4.4.9.2	1
	4b	ACAS/TCAS resolution advisory active [1 bit]	3.4.4.10.1	1
SV Quality	5a	Nav. Acc. Category for Position (NAC_P) [4 bits]	3.4.4.11	1
	5b	Nav. Acc. Category for Velocity (NAC_V) [3 bits]	3.4.4.12	1
	5c	Surveillance Integrity Level (SIL) [2 bits]	3.4.4.13	1
TC Report Management	6a	Current TC Report Cycle Number [2 bit]	3.4.9.5	2
	6b	(Reserved for TC Management Indicator) [3 bits]	3.4.9.6	2
Other	7	Reserved for Future Growth [16 bits]		

Notes for Table 3.4.6:

1. *These SC report elements also reside in the Mode Status report (§3.4.4). Changes in any of their values from those previously broadcast in Mode Status reports trigger the transmission of messages supporting the SC report (§3.4.6.1).*

2. *These SC report elements also reside in the Trajectory Change report (§3.4.9). Changes in any of their values from those previously broadcast in Trajectory Change reports trigger the transmission of messages supporting the SC report (§3.4.6.1).*

3.4.6.1 Conditions for Transmitting the SC Report Information

Messages to support the SC report will be broadcast when one or more of its elements change from their last communicated value in either the MS and TC reports. This report will be broadcast for a time period to be defined in a future revision of this MASPS.

3.4.6.2 SC Report Update Requirements

Note: Specific report update rate and message transmission duration requirements for the SC report are deferred to a future version of this MASPS. However, it is recommended that the SC report should be updated at a rate equal to the State Vector report as defined in Table 3-4(a). The update rate is dependant upon which field has had a change in its value triggering the SC report. This rate should be maintained for a time period of at least 24 seconds for MS report elements (which is the maximum SV coast interval) or twice the maximum TC report update interval for TC elements,.

3.4.6.3 Time of Applicability (TOA) Field for SC Report

The time of applicability relative to local system time **shall** (R3.124) be updated with every SC report update.